

Claims

1. A system comprising at least three network communication units which have a cascade connection including at least one connecting unit, each such connecting unit having a first, second and a third port each having lines for forwarding and receiving data packets and for forwarding and receiving distinctive control messages, a first two network communication units being coupled to the first and third ports of a cascade connecting unit, and a last two network communication units being coupled to the second and third ports of a connecting unit and any intermediate communication unit being coupled to the third port of a respective connecting unit, a data communication path being constituted between the first and last communication units through each connecting unit by way of the first and second ports thereof.

2. A system according to claim 1 wherein each connecting unit includes means for incrementing a signal value representing identification numbering; means for incrementing a signal value representing an active unit count in accordance with signals indicating an operational state of a communication unit to which the connecting unit is coupled; means for effecting by way of the control messages the communication of said signal values along the cascade connection and means for sending to the said communication unit to which the connecting unit is coupled a respective identification value and a common value representing the number of active communication units participating in the system.

3. A system according to claim 2 wherein each communication unit accommodates an interface which is coupled to a single respective port of a connecting unit, and includes means for communicating data packets between the respective communication unit and the connecting unit having said respective port and means for storing said respective stack identification value and said common value.

4. A system according to claim 3 wherein said interface is a modular unit removable from the respective communication unit.

5. A system according to claim 2 and further comprising a connecting cable having means for cooperating with a signal state of said control messages to indicate which end of the cable is connected to a selected port.

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~~6.~~ A connecting unit for use in a system comprising a plurality of network communication units having a cascade connection including said connecting unit, the connecting unit having three ports consisting of a first, second and third port, each port of the connecting unit having lines for forwarding and receiving data packets and for forwarding and receiving control messages, the connecting unit being disposed to increment a first signal value defining an identification number received by way of a control message at the first port, to provide the received signal value by way of a control message to the third port and to provide the incremented signal value by way of a control message to the second port, and the connecting unit being disposed to receive a second signal value defining an active unit count by way of a control message at the first port and to provide said second signal value, incremented or not in dependence on a control message received at the third port, in a control message at the second port.

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7. A connecting unit according to claim 6 wherein the connecting unit is disposed to maintain both forward and return data and control paths between the first and second ports irrespective of the operational state of a communication unit coupled to the third port.

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8. A connecting unit according to claim 6 wherein a power supply bus extends to all three ports.

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9. A connecting unit according to claim 6 wherein the connecting unit is disposed to determine when the second port is not coupled to a connecting unit and to broadcast a common value representing the number of communication units actively participating in said system.

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10. A method of controlling a plurality of network communication units which are linked by a cascade connection that provides a communication path for data packets from any unit to any other unit, comprising:

5 (i) establishing a control path for control messages from each unit to the next, the control path being distinct from said communication path;

10 (ii) sending along said control path control messages which include fields denoting an identification of a communication unit and a count of communication units which are operative to receive and forward data packets on said communication path; and

(iii) for each respective unit:

15 (a) altering the identification to denote the respective unit; and

(b) incrementing the said count if the respective unit is operative to receive and forward data packets on said communication path.

20 11. A method according to claim 10 and further comprising determining when said count is complete and broadcasting a total of said count by way of control messages on said control path.

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